IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)	: Daniel DERIAZ et al.	Group Art Unit: 3725
Appln. No.	: 10/597,741	Examiner: Sullivan, Debra M.
I. A. Filed	: February 6, 2004	Confirmation No.: 5632
For	: APPARATUS AND METHOD FOR PRODUCING TOOTH-LIKE PROFILING ON WORKPIECES	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
U.S. Patent and Trademark Office
Customer Window, Mail Stop **AF**
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Sir:

This request is being filed concurrently with a Notice of Appeal and in response to the Final Office Action dated July 10, 2008. Reconsideration and withdrawal of the rejections, and allowance of the claims are respectfully requested in view of the following remarks.

Remarks

In the Final Office Action, claims 11-18, 22, and 23-30 are rejected under 35 U.S.C. §103(a) for being unpatentable over U.S. Pat. No. 2,991,672 ("Meyer") in view of U.S. Pat. No. 4,307,592 ("Krapfenbauer"). Claims 19-21 are rejected under 35 U.S.C. §103(a) for being unpatentable over Meyer and Krapfenbauer, and further in view of U.S. Pat. No. 5,001,916 ("Schuler"). These rejections are respectfully traversed.

Independent Claim 11

The present invention relates to an apparatus and method for producing workpieces having a defined profiling. More specifically, independent claim 11 recites, in pertinent part:

> ...a first drive structured and arranged to intermittently rotate the workpiece holder about a longitudinal axis of a workpiece held in the workpiece holder;
>
> a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece; and
>
> an electronic control operably connected to the first drive and the second drive, which controls intermittent rotational movement of the workpiece holder based upon the second drive,

wherein the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit that is oriented parallel or obliquely to the longitudinal axis of the workpiece.

The Examiner asserts that Meyer discloses: a first drive for intermittently rotating the workpiece at elements 47-50; a second drive for rotating the tool at elements 29-37; and an electronic control at element 16. The Examiner contends that Krapfenbauer discloses intermittent rotation of the workpiece, and that it would have been obvious to modify Meyer based upon the teachings of Krapfenbauer. Applicants respectfully disagree.

Contrary to the Examiner's assertions, Meyer does not disclose ***a first drive structured and arranged to intermittently rotate the workpiece holder*** and ***a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool,*** as recited in claim 11. Instead, Meyer discloses a machine in which a tool 1 held in a toolholder 3 is used to cold form a workpiece "A." A single drive, i.e., motor 46, causes both rotation of the tool 1 and rotation of the workpiece "A" through various gear trains (i.e., what the Examiner identifies as the drives). For example, motor 46 causes rotation of the workpiece through gears 47-50 (FIG. 8 and lines 58-64 of col. 3). The same motor 46 also causes rotation of the forming tool through gears 39-45 (FIG. 8 and lines 53-57 of col. 3). Thus, in Meyer, the same drive (motor 46) causes both rotation of the workpiece holder and rotation of the forming tools. Therefore, Meyer does not disclose a first drive for intermittently rotating the workpiece holder and a second drive, separate from the first drive, for rotating the forming tool, as recited in claim 11.

Complex gearing systems driven by a single drive motor, such as that shown by Meyer, are known in the prior art and are discussed with respect to FIG. 1 of the instant application. Such gearing systems have the disadvantage that only a single toothing profile can be formed with any one gear arrangement. To provide a different toothing profile (e.g., on a different workpiece), the gear ratio between the single drive and the workpiece holder must be adjusted, which can only be carried out by exchange of the corresponding gears or gearing parts. Such an exchange is time consuming and very cost intensive.

In contrast to Meyer, in embodiments of the claimed invention, a first drive (e.g., drive 11, FIG. 2) intermittently rotates the workpiece holder (e.g., 2). A second drive (e.g., drive 8) rotates the forming tools (e.g., 9). The second drive is separate from the first drive. By using separate drives, instead of a single drive and a complex gearing as shown in Meyer, implementations of

the invention permit different profiling of workpieces without having to go through the time and expense of changing the gears (as required in Meyer).

In the event that the Examiner is interpreting the term "drive" to include gear trains (e.g., elements 47-50 of Meyer), Applicants still submit that the "drives" identified by the Examiner are not separate from one another, as recited in claim 11. Instead, all of the gear trains identified by the Examiner (e.g., elements 47-50 and elements 29-37) are interconnected to one another and are driven by the same motor 46 and, therefore, are not first and second separate drives.

Furthermore, Applicants submit that Meyer fails to disclose or suggest ***an electronic control operably connected to the first drive and the second drive, which controls intermittent rotational movement of the workpiece holder based upon the second drive,*** as recited in claim 11. Contrary to the Examiner's assertions, element 16 of Meyer is not an electronic control. Instead, element 16 is a motor for moving the toolholder 3 along the elliptical path C (col. 3, lines 3-16). There is no suggestion that motor 16 is an electronic control.

Moreover, even if motor 16 is construed as an electronic control, there is no teaching that motor 16 is operably connected to what the Examiner identifies as the first and second "drives" (i.e., elements 47-50 and 29-37). That is to say, motor 16 does not influence the operation of gear trains 47-50 and 29-37, and motor 16 does not control rotational movement of the workpiece holder 12. Instead, motor 16 moves toolholders 3 in the x-y directions along the elliptical path "C." The motor 16 is decoupled from and has no influence on what the Examiner identifies as the first and second drives (e.g., elements 47-50 and 29-37). Applicants note that the Examiner failed to address this argument in the Advisory Action dated October 22, 2008.

Even further, Applicants submit that Meyer fails to disclose ***the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit that is oriented parallel or obliquely to the longitudinal axis of the workpiece.*** Meyer explicitly teaches that the tool 1 is moved in a path C having the shape of a flat ellipse (FIGS. 1 and 8, and lines 13-16 of col. 3). Since a flat ellipse is different from a circular orbit, Meyer does not disclose the recited circular orbit. Applicants note that the Examiner failed to address this argument in the Advisory Action.

Also, Applicants submit that it would not have been obvious to modify Meyer to include ***intermittent rotational movement of the workpiece holder***, as recited in claim 11, as this would change the principle of operation of the Meyer system. In Meyer, the tools roll off the workpiece. This way, the tools form the workpiece in a *kneading* fashion, and an involute toothing is

generated. This indispensably requires a *continuous* rotation of the workpiece. In fact, Meyer explicitly states that the workpiece is continuously rotated (col. 1, lines 29-30; col. 2, lines 29-31). In contrast, embodiments of the invention utilize an *intermittent* rotation of the workpiece which facilitates forming the workpiece in a *stamping* way (rather than a *kneading* way). In embodiments, the intermittent rotation causes a standing still of the workpiece while being hit by the tools, which ensures that the shape of the tools are reproduced in the workpiece. In contrast, in Meyer, the tool's profile is not reproduced in the workpiece, but rather, involutes are formed. Therefore, it would not have been obvious to modify Meyer to intermittently rotate the workpiece holder, as recited in the claimed invention.

Independent Claim 23

Applicants submit that Meyer does not disclose or suggest ***controlling, with an electronic control, a first drive that causes the intermittent rotating and a second drive that causes movement of the at least one forming tool***, as recited in claim 23. As discussed above, Meyer does not disclose an electronic control. Contrary to the Examiner's assertions, Meyer's motor 16 is not an electronic control. Moreover, even if motor 16 is construed as an electronic control, motor 16 does not control a first drive that causes the intermittent rotating [of the workpiece holder] and a second drive that causes movement of the at least one forming tool. To the contrary, motor 16 has nothing to do with the rotation of the workpiece holder 12. Put another way, Meyer's motor 16 does not control what the Examiner identifies as the first drive (e.g., elements 47-50) and the second drive (e.g., elements 29-37). Therefore, Meyer does not disclose the controlling step recited in claim 23.

Furthermore, Applicants submit that Meyer does not disclose or suggest ***the at least one forming tool comprises profiled wheels or rollers that are driven to continually rotate along a circular orbit***, as recited in claim 23. Instead, as discussed above, Meyer discloses a flat elliptical path, with is not a circular orbit. Applicants note that the Examiner failed to address both of these arguments regarding claim 23 in the Advisory Action

Independent Claim 30

Meyer does not disclose ***a second drive, separate from the first drive, structured and arranged to rotate the at least one forming tool to act periodically on the workpiece***, as recited in claim 30. Instead, as discussed above, Meyer discloses a single drive (motor 46) that drives a gear system, which controls both the rotation of the workpiece holder and the rotation of the forming tool. Meyer does not disclose first and second separate drives as recited in claim 30.

Additionally, Meyer does not disclose ***the first, second, and third drives are electronically coupled with one another and connected with an electronic control which controls intermittent rotational movement of the workpiece holder***, as recited in claim 30. Particularly, as discussed above, Meyer does not disclose an electronic control. Meyer's motor 16 is not an electronic control. Moreover, even if motor 16 is construed as an electronic control, motor 16 does not control rotational movement of the workpiece holder 12. Instead, motor 16 only controls the toolholder 3, not the workpiece holder 12. Nor is motor 16 connected to what the Examiner identifies as the first and second drives. Instead, motor 16 is decoupled from and has no influence on gear-train elements 29-37 and 47-50. Applicants note that the Examiner failed to address both of these arguments regarding claim 30 in the Advisory Action

Krapfenbauer and Schuler do not disclose the subject matter noted above as deficient in Meyer. Nor has the Examiner asserted that Krapfenbauer or Schuler teaches such features. Therefore, the applied art fails to disclose the combinations of features recited in independent claims 11, 23, and 30.

Claims 12-22 and 24-29 depend from independent claims 11 and 23, respectively, and are distinguishable from the applied art at least for the reasons discussed above with respect to the independent claims. Moreover, the applied art fails to disclose or suggest many of the features recited in the dependent claims. For example, contrary to the Examiner's assertions, Meyer does not disclose ***the electronic control causes left hand rotation, right hand rotation, or standstill of the workpiece***, as recited in claim 26, or ***the electronic control controls axial advancement of the workpiece***, as recited in claim 28. To the contrary, what the Examiner identifies as the electronic control (i.e., motor 16) has nothing to do with the rotation or axial movement of the workpiece "A." Instead, motor 16 only controls the toolholders 3 (not the workpiece holder 1).

Conclusion

Reconsideration of the Final Office Action and allowance of the present application and all the claims therein are respectfully requested and believed to be appropriate.

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Respectfully submitted,
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